

REMARKS

This is a Preliminary Amendment prior to examination of this Application by the Examiner.

This Application is a Continuation-In-Part (CIP) of parent application Serial Number 10/350,372 filed January 23, 2003. In addition, this CIP was filed as a PCT application Serial Number PCT US 04/01312 on which the present Examiner has already issued a Search Report. It is in connection with that Search Report that this Preliminary Amendment is presented. In that regard, the amendments presented herein respond to the issues raised in the Search Report under the assumption that the present Examiner would cite the same art as the basis of examination of this corresponding U.S. Patent Application. This position is believed to be accurate in view of the telephone conference between the undersigned and Examiner Lorengo on Wednesday, January 19, 2005.

The amendments made in this Preliminary Amendment highlight the invention and distinguish the inventive concept over the cited art of the Search Report.

In order to appreciate the relevance of the amendments made herein, Claim 1, as filed, is reproduced below. (emphasis added)

1. A process for transferring information from an information-bearing multilayer structure to a substrate which comprises
 - a) providing an information-bearing multilayer structure comprising
 - i) a carrier layer which may or may not be peelable away from the structure,
 - ii) information desired to be transferred to a substrate, and
 - iii) a layer comprising a solid, radiation-curable resin,
 - b) providing a substrate having an information-receiving surface to which it is desired to transfer said information,
- c) contacting said information-receiving surface of said substrate with said layer comprising said solid, radiation-curable resin under conditions of temperature and

- c) contacting said information-receiving surface of said substrate with said layer comprising said solid, radiation-curable resin under conditions of temperature and pressure sufficient to transfer said information from said information-bearing multilayer structure to said information-receiving surface, and
- d) subjecting the radiation-curable resin to sufficient radiation with or without a photoinitiator to effect a cure thereof and thereby cause said information to be bonded to said information-receiving surface.

Note that in step a)iii., the multi-layer structure is set forth as comprising

“a layer comprising a solid radiation-curable resin”.

That phrase impliedly connotes an unirradiated, “radiation-curable” resin. To clarify that point, however, and to make it absolutely clear that what is being claimed in the amended process claims herein is a layer comprising a solid, previously unirradiated radiation-curable resin. Thus, the claim has been amended herein by amending the phrase to read:

“ a layer comprising a solid, previously unirradiated radiation-curable resin.”

Note that the unirradiated radiation- curable resin is ultimately irradiated to cure in step d) of claim 1.

The amendment is fully supported by the Specification in which it is clear that there is no irradiation until step d) is performed, i.e. after the entire structure has been assembled in steps a), b), and c). It should also be clear that the term “radiation” “radiate” “irradiate” and like terms used herein are meant to apply to radiation from radiation devices and excludes radiation from normal light ambient conditions. Thus, “not previously irradiate” means that the material has not been submitted to radiation devices. Corresponding amendments have been made in the remaining process steps c) & d) of claim 1. That is, the claim still calls for contacting the substrate with the

previously unirradiated radiation-curable resin under the conditions sufficient to transfer the information to the substrate (step c) and then subjecting the previously unirradiated radiation-curable resin to the curing step d) thereby causing a very strong bond to be formed between the structure and the surface of the substrate.

In the aforementioned PCT version of the present application, the Examiner has rejected all the claims, except Claim 9, on the basis of being fully met by each of Doi and Curiel and of being obvious over Doi and Minnetian. The essence of the rejection over Doi is based totally on anticipation, i.e. that a curable resin has been applied to a carrier layer containing information to be transferred and then that layer subsequently cured after being added to a substrate. Claim 9 was not rejected at all and presumably is allowable.

Applicant submits however, that the references do not support a rejection based on either anticipation or obviousness since they all require the use of partially cured resins from a pre-irradiation. Notably, Doi specifically requires that the solid curable resin be half-cured by radiation before it is transferred to the material which it is designed to protect. In carrying out his process, therefore, Doi applies a solid curable resin to a polyester carrier film, and then irradiates the resin to a half-cure. He then affixes or laminates the carrier structure carrying the solid resin in the half-cured state, onto a metal film. He states that it is absolutely essential that the half-cured process be used to obtain the advantage of his invention, i.e. to avoid losing the metallic luster of the metal film. Doi then applies his three-layered, half-radiation-cured transfer sheet onto a substrate. He then removes (peels away) the releasable top carrier layer and then further irradiates

the half-cured resin to the point of being completely cured. He states also that he could irradiate through the releasable layer before peeling.

From a process point of view, therefore, Doi does not transfer an “unirradiated”, solid, radiation-curable resin to the substrate as Applicant does. The material Doi transfers is at least partially cured because it has previously been irradiated to a half-cure. Applicant, on the other hand, does not irradiate until after the carrier structure carrying the radiation-curable resin is applied to the substrate. The Doi process is thus markedly different from the instantly claimed process.

Moreover, Doi does not suggest or teach using a layer comprising an unirradiated, solid, radiation-curable resin and then curing by irradiation only after application to a substrate. In fact, his teachings are diametrically opposed in that he alleges that the partial irradiation is the only way he can maintain the luster on a metal layer, thus, eschewing initially unirradiated resin. In this regard, Doi states as follows: (See page 4 of the English Translation of Doi.)

“However, since the above protective layer is not cured on the transfer sheet and the heat resistance is the same or worse than that of a thermoplastic resin, the protective layer melts and flows if there is too much heat during transfer. As a result, there is a drawback because the metal luster of the thin metal film layer becomes dull.

(Problems to be Solved by the Invention)

The problem of this invention is to eliminate the above-mentioned drawback while providing the protective layer by using a thermoplastic ionizing radiation-curable [SIC] which, in the uncured state, is a solid at room temperature.

(Means for Solving the Problems)

In this invention, the above-mentioned problem could be solved by using a “thermoplastic ionizing radiation-curable resin which, in the uncured state, is a solid at room temperature,” providing a protective layer, and bringing the protective layer into a half-cured state.” *(all emphasis added)*

This clearly leads one away from the instant process and toward a pre-irradiation.

In summary, Doi does not anticipate the instant process and, as importantly, does not suggest Applicant’s process.

A similar rejection was applied based on Curiel. The Curiel patent relates to a method and apparatus for creating a tamper evident package having a radiation-cured coating material in a precise location on a package. Curiel deliberately pre-irradiates and application to a substrate irradiates his pre-irradiated coating to a hard, brittle, easily destroyable cure state so that evidence of tampering is indicated by a destruction (shattering) of the coating material.

Specifically, Curiel’s method involves depositing a liquid resin in a recess on a carrier tape and then, before applying to a substrate, irradiating the liquid resin to a partial cure leaving an adhesive portion of the resin. This material, i.e. the partially irradiated resin, is to become the tamper evident indicator after completion of the curing in a second irradiating step after application to the substrate.

Referring now to the Curiel patent, the resin is formed in a recess of a carrier tape, (see Figure 1). The recess is at 110 and the carrier tape is at 104. The resin is dispensed into the recess 112 as an uncured molten resin. It passes from there to the recess designated as 114 and it is partially cured by a UV radiation device 162 so that a tack free, dry layer 164 is created while the lower part of the resin 165, which is contact with the tape, retains it adhesiveness. The partial curing creates sufficient resiliency within the

resin such that when the carrier tape changes direction by going around a roller and makes a sharp turn, the half-cured resin will remain straight, separating from the tape, the lower part of the resin (165) coming into contact with a substrate (package 190) and adhering to the package. Thus, the partially cured resin comes off the carrier tape having a top layer, which is tack free and dry, and a lower part, which is adhesive. As can be seen from Figures 1 and 2, part 196 of the label is adhered to the package 190 while part 197 is protruding from the side of the package. Both parts are then adhered to the package by providing a swinging roller (see Figure 2) which moves up and down to urge both parts 196 and 197 of the label into intimate bonding relationship with the package 190.

The label 170 on the package is then subjected to a second exposure of UV light by a second radiation device, designated 210, in order to create the tamper evident label 211. The second exposure cures the adhesive and makes the resin hard and brittle. The point of this is to create a physical structure which shatters when tampered with, thus indicating a breach of the package. The bond is preferably such that a tampering of the package will cause the brittle material to fracture into sections, separate from the package, and thus indicate tampering. This technique has nothing to do with protecting the package itself from outside sources as is being done in the Applicant's case. From a process standpoint, Curiel does not cure an initially unirradiated resin and in that respect, is similar to Doi.

Not only has this technique nothing to do with protecting a substrate but, in fact the resin (and curing process) is specifically designed to become hard and brittle to shatter upon impact. Nothing could be further from Applicant's desired result in a cured resin,

namely to protect the coating in a way which preserves the integrity of the entire cured resin and the substrate.

In summary, both Doi and Curiel apply a previously unirradiated resin in an uncured state to a carrier and then, before it is applied to the substrate, irradiate the resin to a partial cure. Only after this step is the partially cured resin on the substrate completely cured by radiation. Contrast this to the instant claim in which an unirradiated resin is irradiated only after application to the substrate.

Finally, the Minnetian method involves applying an uncured, UV curable resin to a hot stamping foil and irradiating to a partial cure before the foil is allowed to contact a carrier layer. After irradiation, a security mark is punched out from the foil to a carrier layer, which then passes through another irradiating station to complete the cure. This process thus also again involves pre-irradiating the material before it is applied to the substrate (foil) followed by a complete cure after the foil security marks have been applied to the substrate. Applicant's process, of course, does not use pre-cured resin prior to the final curing bonding step and the combination of Minnetian with Doi does nothing to suggest eliminating the pre-irradiation.

For all of the foregoing reasons, Applicant submits that the art cited in the Search Report does not render the claims of the instant application, as amended, unpatentable.

Newly added claims 54-62 are directed to specific embodiments illustrated by the examples and those described more generically in the Specification.

Thus, new claim 54 is directed to the process of claim 3 wherein the carrier layer is peelable thus patterning claim 9 for the unpeelable carrier layer. This language is supported in the Specification in Example 5, among other places.

New claim 55 and new claim 56 are directed to non-peelable and peelable layers respectively and depend from claim 4 directed to vinyl group functionality. This is supported in the Specification at page 20, lines 7-9.

New claims 57, 58 and 59 depend from claims 54, 55 and 56, respectively and are directed to a polyester material for the carrier layer of those claims.

New claim 60 is directed to the process of claim 1 wherein the layer comprising the radiation-curable resin additionally comprises a solid, heat-sensitive resin adhesive. This language is supported in the Specification at page 20, lines 4-6.

New claim 61 depends from claim 60 and claims the use of heat sensitive resins which lack radiation-curable functional groups in the layer which comprises the radiation-curable resin. Support for this will be found on page 20 in the Specification, lines 13-15 and in Examples 2-5. Examples 2-5 expressly describe as the layer comprising the radiation-curable resin, a blend comprising two resins, one of which is a radiation-curable epoxy resin designated DER 661 (source identified in the Specification) while the other of which is a non-radiation-curable resin designated Phenoxy PKCP-67, described in Example 2 as a caprolactone-modified phenoxy resin available from InChem, Inc., Rock Hill, South Carolina. This resin is a poly(hydroxy ether) phenoxy resin having no radiation-curable functionality. Claim 61 is directed to this embodiment.

New claim 62 is directed to the actual embodiment of the heat-sensitive resin of claim 61 as described in Example 2.

With further respect to the Search, Examiner did not reject in any way Claim 9 of the Application. This Claim depends from claims 3,2 and 1, and is directed to a radiation-curable resin which comprises epoxy group functionalities and wherein the

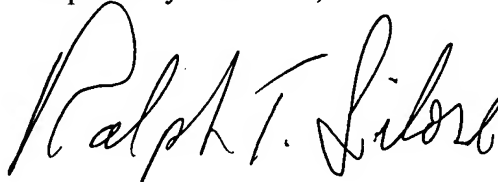
carrier layer is not peelable away from the information to be transferred after step d), is performed. The Search Report notes that this claim is novel and possesses an inventive step. It should be noted that Applicant also regards the “peelable” version, and the use of functional groups containing vinyl radicals, to be patentable as well over the art cited in the Search Report. Since that art does not disclose or suggest Applicant’s inventive concept of not pre-irradiating the radiation-curable resin before application to the substrate, and fully irradiates to a strong bond thereafter, it is submitted that the peelable and vinyl functionality versions of the invention are likewise patentable.

In summary, the essence of the art relied on by the examiner in each instance, recites the application of an unirradiated radiation-curable resin to a carrier layer, followed by the irradiation of the resin to partial cure, followed by application of the partially cured resin to a substrate followed by a second irradiation of the resin on its substrate. In one case, at least, the Minnetian reference, the curing was so overdone as to deliberately form a brittle, shattering type of bond to the substrate, a condition totally anathema to the intent of Applicant’s process requiring the presence of a strong tenaciously bonded material to act as a protective coating and not shatter or be subjected to environmental abuse.

With respect to the addition of the new claims, it is noted that Applicant has already paid for a total of 53 claims and by the present amendment has cancelled 27 claims. The addition of 9 new dependent claims does not add any net amount of claims, and therefore, the original fee is sufficient to cover the present amendment. Accordingly, no fee is enclosed herewith.

In view of the foregoing, it is earnestly solicited that the Preliminary Amendment presents the claims in condition for allowance over the art expected to be cited in this Application and therefore, Applicant requests an early and favorable allowance.

Respectfully submitted,

A handwritten signature in black ink, reading "Ralph T. Lilore". The signature is written in a cursive, flowing style with a large initial "R".

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Enclosures

Information Disclosure Statement with
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